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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,330	01/14/2002	Andrew G. Carlidge	PRP102US	9906

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EXAMINER

VERBITSKY, GAIL KAPLAN

ART UNIT	PAPER NUMBER
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2859

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/047,330

Applicant(s)

CARTLIDGE, ANDREW G.

Examiner

Gail Verbitsky

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed on May 02, 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16, 18-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 18-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10, 12-16, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuyuki et al. (U.S. 5876327) [hereinafter Tsuyuki] in view of Takamine et al. (U.S. 2002/0126591) [hereinafter Takamine].

Tsuyuki discloses in Fig. 1 an optical system comprising an optical sensor (CCD camera) 48 having an array of light receptors having a pixel pitch, a lens (imaging lens system) 43 associated with the camera along the optical path, the lens configured with optical parameters (magnification, and numerical aperture with a stop 44) that should inherently be compatible (functionally related) to the camera and thus, to the pitch and a desired (effective) resolution (col. 7, lines 46-47) of the camera and thus, the optical system. The lens, along with a variable stop 44, can map an image (a portion) of an object to associated light receptors of the camera. Inherently, there is an illumination source (visible or non-visible) to illuminate the object. For claims 2, 6 and 14-16: this is inherent that the magnification is related to a desired (effective) resolution and a pixel pitch, and thus, it is related to their ratio. It is also inherent that a numerical aperture is related to a wavelength of the light of the illumination source and a desired resolution, and thus, the numerical aperture is related to their ratio.

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For claims 3 and 15: according to formula (5), the numerical aperture is functionally related to a ratio of a wavelength (λ) of a light illuminating the object and a frequency, while the frequency is related to an effective resolution, thus, the numerical aperture is functionally related to a ratio of a wavelength (λ) of light illuminating the object and the effective resolution.

For claims 4 and 18: as shown in equations in col. 8, the desired (allowed) resolution is limited (at least equal) by diffraction limit in the extremely small aperture diameter (spot size). Also, the particular value (size) of a resolution, as stated in claims 4 and 18, absent any criticality, is only considered to be the “optimum” value of the resolution for the system disclosed by Tsuyuki that a person having ordinary skill in the art would have been able to determine using routine experimentation based, among other things, on the desired accuracy of the device, the intended use, etc. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

For claim 7: the device comprises an aspherical lens (col. 9, line 43).

For claim 8: a first lens 43 positioned closer to an object and having the focal length minus 38.308 which is less than the focal length of plus 12.496 of the second lens 46 positioned closer to the camera 48 (col. 13, lines 14-50 and Fig. 13).

Tsuyuki does not explicitly teach the particular relationship between the numerical aperture, wavelength and a pixel pitch (formula), as claimed by applicant in claim 1.

Takamine teaches a device having a predetermined desired pixel pitch, which is equal or greater than λ over numerical aperture (NA). Thus, NA is equal or less than λ over Y. Thus, inherently, it can be twice less than λ over Y, in other words, it can be equal $0.5 \times \lambda/Y$.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device disclosed by Tsuyuki, so as to have a pixel pitch greater than λ divided by the numerical aperture, as taught by Takamine, in order to provide the user with the pixel pitch compatible with the aperture of the lens and the light radiated onto the surface of the device, and thus, to achieve a desired resolution and accuracy of the device.

For claim 13-16 and 19: the method steps will be met during the normal manufacturing process of the system stated above.

3. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuyuki and Takamine as applied to claims 1-10, 12-16, 18-20 above, and further in view of Pollard et al. (U.S. 6249360) [hereinafter Pollard].

Tsuyuki and Takamine disclose the device and the method as stated above in paragraph 2.

They do not explicitly state that the illumination source is an LED.

Pollard discloses a system wherein an illumination source is an LED.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the illumination source, disclosed by Tsuyuki and Takamine, with the LED, as taught by Pollard, because both of them are alternate types of illumination sources which will perform the same function of illumination an object of interest, if one is replaced with the other.


Conclusion

4. The prior art made of record and not relied upon considered pertinent to applicant's disclosure.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Verbitsky who can be reached at (703) 306-5473 Monday through Friday 7:30 to 4:00 ET.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-5473.

GKV


Gail Verbitsky
Patent Examiner, TC 2800

June 16, 2003